REMARKS

Initially, Applicants thank the Examiner for acknowledging the claim for priority under 35 U.S.C. §119(e). Applicants also note the Examiner's objection to the informal drawings submitted with the application as filed. While the outstanding Office Action was not accompanied by a Draftsperson's Patent Drawing Review Form PTO-948 indicating the particular grounds of objection, Applicants are submitting formal drawings concurrently herewith in an effort to advance prosecution of this application in accordance with 37 C.F.R. §1.85(a).

Claims 1-19 are all the claims pending in the present application. Claims 1-19 stand rejected under 35 U.S.C. §103(a) as unpatentable over United States Patent 4,760,385 to Jansson et al. (Jansson) in view of United States Patent 5,687,251 to Erler et al. (Erler). Applicants respectfully traverse the prior art rejections, and request reconsideration and allowance of all the pending claims based upon the following remarks.

Aspects of the present invention are generally related to calibrating a scanning system to correct possible panel misalignment errors. In accordance with some embodiments, a reference slide or data point may be used to obtain a series of measurements which may be compared to expected results. Alignment calibration data may be used to determine positioning and orthogonality errors in the scanning system; adjustment parameters or an adjustment algorithm based on the calibration data may be applied during image acquisition to correct alignment errors in the scanning system. Specifically with respect to employing calibration data to correct alignment errors, claim 1 recites an element directed towards "creating a solution model," claim 8 recites an element directed towards "creating adjustment parameters," and claim 14 recites using "an adjustment algorithm." As set forth in more detail below, at least the foregoing elements are neither disclosed nor suggested by the references cited.

In that regard, Applicants submit that the art cited is more deficient than the Examiner acknowledges. In particular, the Examiner cites two references that are unrelated to the aspects of the invention set forth in the present application and recited with particularity in the pending claims. A brief discussion of the references cited by the Examiner follows.

Jansson

The Jansson reference describes a system that assembles a number of scanned images into a large mosaic image. The system set forth in Jansson relies upon accurate stage motion to ensure precise alignment of mosaic image tiles; this reliance is required, since the Jansson reference neither describes nor contemplates any compensation technique to correct for stage errors during image scanning. The Examiner has recognized Jansson's deficiency in this regard at page 3 of the outstanding Office Action. Specifically, the pending claims all recite elements directed towards creating a solution model (claim 1), creating adjustment parameters (claim 8), or using an adjustment algorithm (claim 14), a feature which the Examiner admits is clearly lacking in Jansson.

Additionally, the portions of the Jansson reference cited by the Examiner do not bear relevance to the pending claims. The text at col. 5, ll. 17-18, of Jansson asserted by the Examiner in rejecting claims 1 and 8, for example, discusses only a "calibrated image pixel size" for a particular objective lens. These "calibration" data are obtained from a look up table, relate only to an individual image pixel size, and are entirely unrelated to the calibration data set forth in the present application which are directed to measuring and modeling stage motion errors (*see, e.g.*, pages 11 through 14 of the present application).

Similarly, the text at col. 5, ll. 19-22, of Jansson simply discusses the calculation of total mosaic image size based upon calibrated pixel size. While an operator may manipulate the mosaic image marker to frame an area of interest on the substrate (Jansson, col. 5, ll. 22-25), neither this nor any other portion of Jansson suggests the positioning and orthogonality error determination recited in the pending claims as the Examiner asserts.

In rejecting claim 3, the Examiner has cited the text at col. 5, line 34, of Jansson. While the Examiner is correct that this portion of the reference discusses automatically advancing the stage assembly under computer control, the Examiner has failed to appreciate that this automated motion of the stage assembly in Jansson is not modified "to compensate for errors" based upon calibration data. Again, the portion of the reference relied upon by the Examiner neither teaches nor suggests the subject matter recited in pending claim 3.

In rejecting claims 4 and 10, the Examiner has cited col. 5, ll. 17-22, of Jansson as somehow relevant to the recited "determining calibration data based on stepping data." One

method of acquiring stepping data is set forth with reference to FIG. 2A in the present application in the paragraph bridging pages 11 and 12. Applicants submit that the description at col. 5, ll. 17-22, of Jansson does not relate in any way to stepping data as set forth in the present application and as recited in claims 4 and 10.

In rejecting claims 5, 11, and 19, the Examiner has cited the text at col. 2, ll. 45-49. This portion of Jansson discusses repeated positioning of an object with respect to the image sensor, acquiring digitized images, and storing image tiles in a contiguous set of x,y locations in a mosaic image. This produces a total mosaic image that may be recalled as a whole. While it is difficult to divine the Examiner's intent in citing this portion of the reference, Applicants infer that the Examiner intended to cite this portion of Jansson with respect to claims 4 and 10 rather than to claims 5, 11, and 19. In either event, Jansson fails to teach or even to suggest modeling and compensation of stage errors in order to produce accurate stage motion; as discussed above, the Jansson system cannot compensate for alignment errors. Furthermore, Jansson neither teaches nor suggest determining calibration data using a reference slide as recited in claims 5, 11, and 19.

In rejecting claims 6 and 12, the Examiner has cited block 214 in FIG. 3B of Jansson as relevant to determining calibration data based on sub-spot data. Block 214 is related to computing a maximum mosaic image size as set forth at col. 5, l. 19, and col. 7, ll. 36-38. While block 213 of FIG. 3B is more relevant than block 214, Applicants note that even block 213 fails to teach or to suggest basing calibration data on sub-spot data as recited in claims 6 and 12 and as described with particularity in the present application, for example, at page 13 with reference to FIG. 2C.

In rejecting claims 7 and 13, the Examiner has cited col. 4, ll. 29-36, of Jansson. This portion of the reference is related to a discussion of precision closed loop control over a range of motion; Jansson neither discloses nor suggests determining calibration data based on absolute data as described in the present application (paragraph bridging pages 13 and 14) with reference to FIG. 2D and as specifically recited in claims 7 and 13.

In rejecting claim 9, the Examiner has located a description of "acquisition of the mosaic image" set forth at col. 3, ll. 7-15, of Jansson. In that regard, Jansson fails to disclose adjusting

the location of the x,y coordinates of each portion of the mosaic based on adjustment parameters as recited with particularity in claim 9.

Regarding claim 8, Applicants note that the Jansson reference is deficient in the same manner as set forth above with reference to claim 1. Again, the casual reference to calibration in the text at col. 5, ll. 17-18, of Jansson is related only to a "calibrated image pixel size" for a particular objective lens. Such "calibration" data are not useful for the "applying adjustment parameters" to control relative positions of structural elements of the scanning system. As noted above, the Jansson reference neither teaches nor suggests calibration data related to measuring and modeling stage motion errors (*see, e.g.*, pages 11 through 14 of the present application) as recited in claim 8.

Regarding claim 14, Applicants respectfully submit that the portions of Jansson cited by the Examiner fail to address the adjustment algorithm which enables the processor to modify movement of the staging area. As noted above, the Jansson system is not capable of providing adjustments to the relative positions of structural elements of the scanning system using calibration data and adjustment parameters. The Jansson reference neither teaches nor suggests calibration data related to measuring and modeling stage motion errors (*see, e.g.*, pages 11 through 14 of the present application) and compensating therefor as recited in claim 14.

Erler

The Erler reference fails to supply the deficiencies of Jansson. The system described in Erler, for example, deals with preferential image segmentation and binarization. While the Examiner has cited the text at col. 5, l. 61 through col. 6, l. 7, of the Erler reference as teaching "creating a solution model based on positioning and orthogonality data" as recited in claim 1, Applicants note that this portion of the reference is particularly directed to "video camera optical density calibration." In accordance with the Erler disclosure, the digitized specimen image itself is modified; this modification is based upon the video camera optical density calibration—this portion of Erher is not related in any way to determining positioning and orthogonality errors in the scanning system.

Even if the Examiner erroneously interprets the equation set forth at the top of column 6 in Erler as a "solution model," that "solution" is clearly not based upon positioning and

orthogonality errors as recited in claim 1. Further, the Erler reference neither teaches nor suggests modifying the position of an image area based on a solution model as recited in claim 2.

Additionally, as motivation to combine Erler with Jansson, the Examiner cites a portion of Erler (col. 2, ll. 34-40) that simply discloses digitizing a specimen image obtained from a microscope or other magnifier, a feature already clearly disclosed in Jansson.

Even assuming, *arguendo*, that the combination of Erler with Jansson is proper, the references, even if considered in combination, fail to teach every element recited in claims 1-19. The Examiner has failed to establish a *prima facie* case of obviousness; accordingly, claims 1-19 are allowable as set forth below.

The Rejections

As noted above, claims 1-19 stand rejected under 35 U.S.C. §103(a) as unpatentable over Jansson in view of Erler. MPEP §706.02(j) sets forth the following criteria for establishing a *prima facie* case of obviousness under 35 U.S.C. §103(a): a suggestion to combine the references; a reasonable expectation that the combination of references will produce an operative or successful system or method; and the references, when combined, must teach or suggest all the claim limitations.

At least because the suggestion to combine Jansson and Erler is specious and because the combination fails to teach every element recited in the claims, Applicants submit that the rejections under 35 U.S.C. §103(a) are improper.

The references, even when considered in combination, fail to teach at least "creating a solution model based on positioning and orthogonality data" as called out in claim 1. The claims depending from claim 1 each recite additional features that are neither taught nor suggested by the cited art. Accordingly, the asserted references are insufficient to render obvious claim 1 and its dependencies, and the rejection under 35 U.S.C. §103(a) is improper. Applicants submit that claims 1-7 are allowable at least for these reasons.

The Jansson and Erler references, even when considered in combination, fail to teach at least "creating adjustment parameters based on calibration data" and the two "applying the adjustment parameters" elements recited in claim 8. The claims depending from claim 8 each recite additional features that are neither taught nor suggested by the cited art. Accordingly, the

asserted references are insufficient to render obvious claim 8 and its dependencies, and the rejection under 35 U.S.C. §103(a) is improper. Applicants submit that claims 8-13 are allowable at least for these reasons.

With respect to claim 14 and its dependencies, the Jansson and Erler references, even when considered in combination, fail to teach at least a processor which "creates an adjustment algorithm to modify movement of the staging area to compensate for the calibration data." The claims depending from claim 14 each recite additional features that are neither taught nor suggested by the cited art. Since the asserted references fail to disclose every element recited in claim 14, the rejection under 35 U.S.C. §103(a) is improper. Applicants submit that claims 14-19 are allowable at least for these reasons.

CONCLUSION

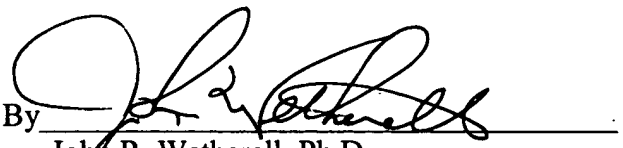
Based upon the foregoing analysis, Applicants respectfully submit that the present application is currently in condition for allowance. The Examiner is encouraged to contact the undersigned at 858-509-4007 if it is believed that a discussion may advance the prosecution of this case.

Applicants believe that fee is required at this time. Please apply any charges or credit any overpayments to Deposit Account No. 50-2212.

Respectfully submitted,

PILLSBURY WINTHROP LLP

Date: August 12, 2003

By 

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